

Terapia chirurgica dell'intestino



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Ministero della Salute



Italiadomani
PIANO NAZIONALE
DI RIPRESA E RESILIENZA

**MIRAGE: tumori neuroendocrini,
uno sguardo al futuro**

Sabato 3 ottobre 2026

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Si-NEN , numeri

Small Intestine Neuro Endocrine Neoplasia



Definizione *Neoplasie NeuroEndocrine*



Neoplasie definite rare

Ben differenziate (NET- tumours)

- G1 (Ki-67 <3%, 2 mitosi/2mm²)
- G2 (Ki-67 3%-20%, 2-20 mitosi/2mm²)
- G3 (Ki-67 >20%, >20 mitosi/2mm²)

Poco differenziate (NEC-carcinoma)

WHO Classification 2022-IARC

Incidenze



- 1974 1,09 per 100'000

6,96 per 100'000
aumento di 6,4 volte

GEP GastroEnteroPancreatic NEN **3,56 per 100000**

Si – NEN **1,05 per 100000**

Surveillance, Epidemiology, and End Results (SEER)

- 30 % sintomatiche (Carcinoid Syndrome – Carcinoid Heart Disease)
- Prevalenza in aumento



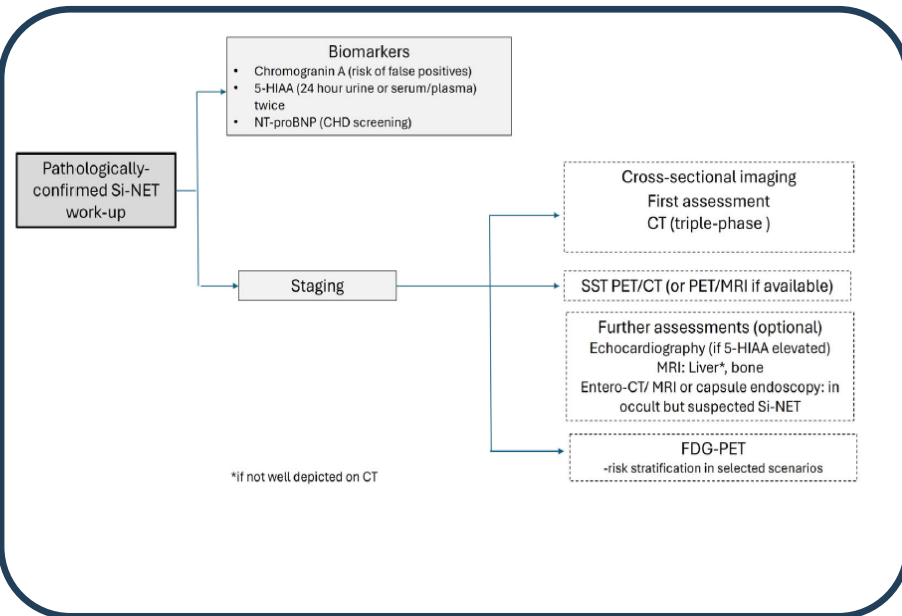
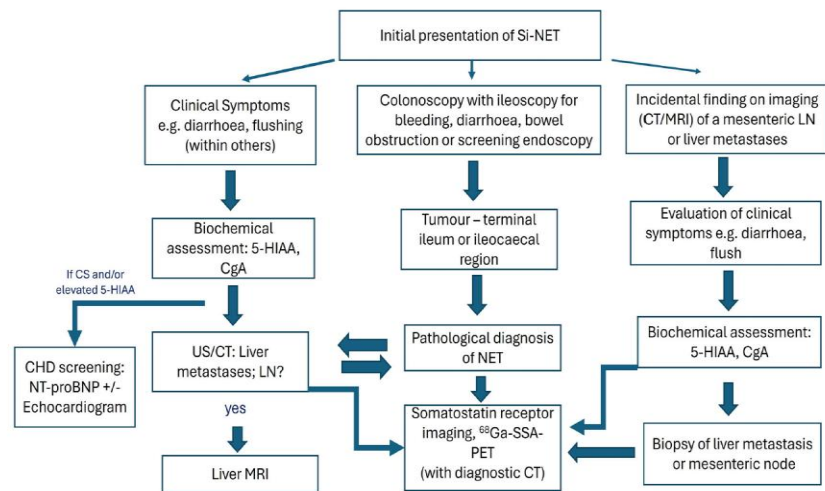
Diagnosi e multidisciplinare

Algoritmi



LAMARCA ET AL.

Journal of Neuroendocrinology | WILEY | 3 of 20



23rd Annual ENETS Conference



Recommendations:

Management of Si-NET requires a specialised multidisciplinary team (MDT) for the complexity of the disease for appropriate diagnostic and treatment decisions. Specialised centres with high level of expertise should treat most of these patients, especially in the advanced setting (RECOMMENDATION A-5). Assessment of symptoms with special focus on CS is crucial (RECOMMENDATION A-2b).



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Una lesione singola del tenue va resecata

Alta probabilità di metastasi linfonodali anche in dimensioni < 10 mm

TABLE 3 Pooled proportions for postoperative outcomes, stratified for median number procedures per year

Outcomes ^a	Procedures per year	
	8 or less	9 or more
30-day mortality	1% (95% CI = 0%-2%), $I^2 = 0\%$	2% (95% CI = 1%-3%), $I^2 = 0\%$
90-day mortality	1% (95% CI = 0%-2%), $I^2 = 0\%$	4% (95% CI = 2%-6%), $I^2 = 0\%$
In-hospital mortality	1% (95% CI = 0%-2%), $I^2 = 0\%$	N/A ^b
Overall morbidity	15% (95% CI = 6%-31%), $I^2 = 89\%$	10% (95% CI = 5%-20%), $I^2 = 81\%$
Severe morbidity	9% (95% CI = 6%-16%), $I^2 = 0\%$	4% (95% CI = 2%-7%), $I^2 = 0\%$

Abbreviations: CI, confidence interval.

^aForest plots of individual analyses are presented in (Figure S4).

^bThis proportion could not be calculated as only one study reported this outcome.

Laparoscopia > Laparotomia
in centri ad alto volume

Resezioni improprie e peggior outcome in interventi d'urgenza

Kacmal E et al. 2021



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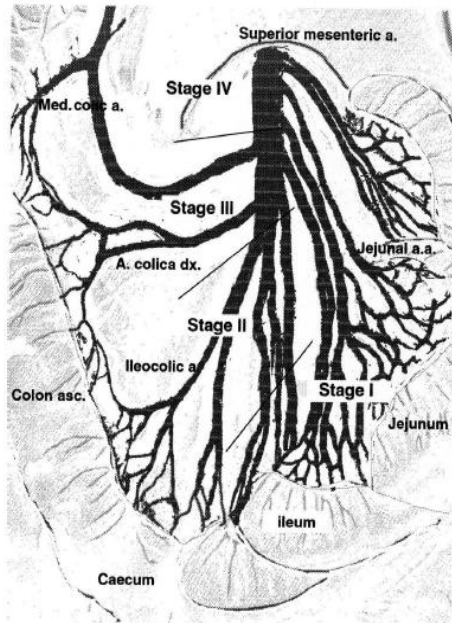
World J. Surg. 24, 1402-1408, 2000
DOI: 10.1007/s002680010232



Method for Dissection of Mesenteric Metastases in Mid-gut Carcinoid Tumors

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Stadi I e II operabili

Stadi III (upper) borderline

Stadi IV inoperabile



Öhrvall U et al. 2000



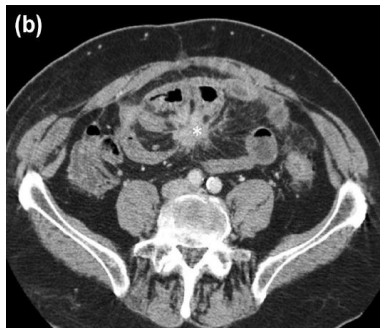
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Grado invasione SMA

Grado invasione SMV

MF – Mesenteric Fibrosis



	Univariate		Multivariable	
	Odds-ratio (95% CI)	p value	Odds-ratio (95% CI)	p value
Age at surgery, years	1.04 (0.75–1.44)*	0.82	–	–
BMI (kg/m ²)	0.33 (0.10–1.07) [†]	0.07	–	–
KI-67	2.30 (0.92–5.76) [‡]	0.07	–	–
Metastasis				
No	Ref		–	–
Yes	0.96 (0.21–4.35)	0.96	–	–
Metastasis site				
No metastases	Ref			
Liver only	0.35 (0.06–2.03)	0.24	0.61 (0.08–4.93)	0.64
Liver and/or other sites	9.00 (1.14–71.0)	0.04	13.2 (1.14–154)	0.04
MF				
No	Ref.		Ref.	
Yes	17.5 (2.84–108)	0.002	16.2 (1.97–134)	0.01
Liver tumor burden				
< 25%	Ref			
25–50%	0.43 (0.05–3.97)	0.46	–	–
> 50%	2.00 (0.29–13.9)	0.48	–	–
SMV infiltration				
None or distal	Ref.			
Proximal [‡]	Not estimable	–	–	–
SMA stage [‡]				
1–3 down	Ref.		–	
3 up–4	50.4 (5.08–500)	<0.001	–	

MF mesenteric fibrosis, SMV superior mesenteric vein, SMA superior mesenteric artery

*by 5 years age units increase; [†]by 5 units increase; [‡]not included in multivariate analysis because of small number of events (no events for proximal infiltration level)

Razionale chirurgico

Fibrosi Mesenterica



40% dei Si-NET
M>F
Masse > 24 mm
Livelli di 5-HIAA

Ischemia (*EVS elastic vascular sclerosis*)
Occlusione intestinale

Mesenteric Fibrosis in SI-NET Mesenteric Metastasis

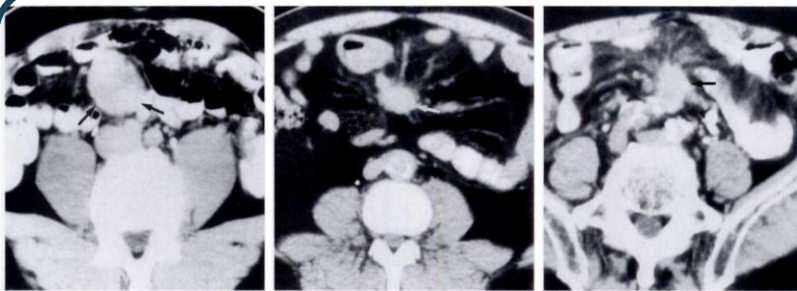
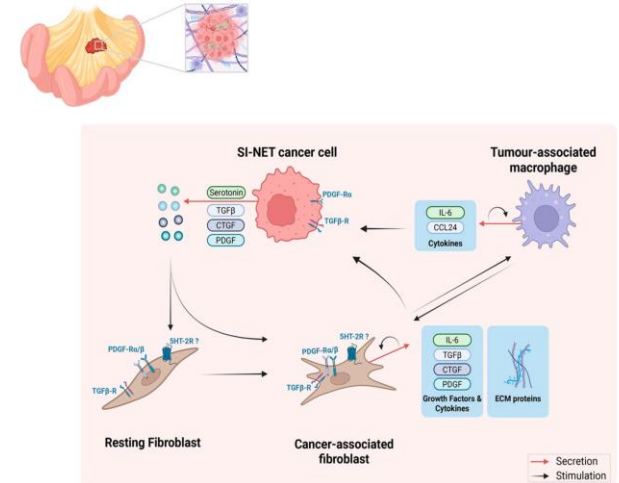
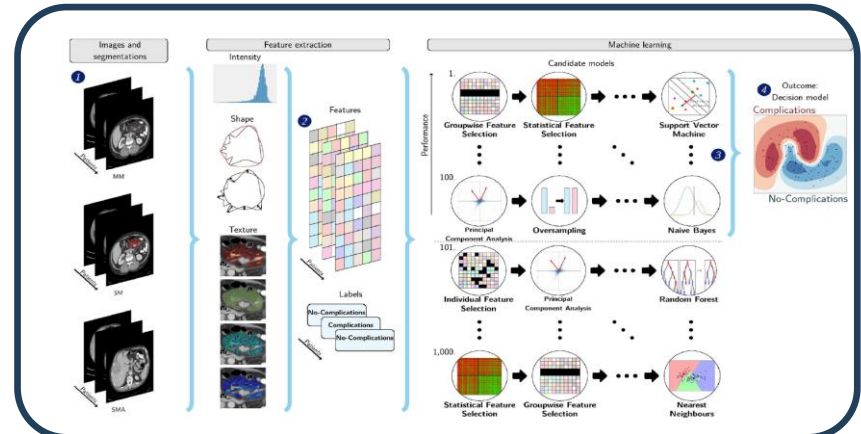


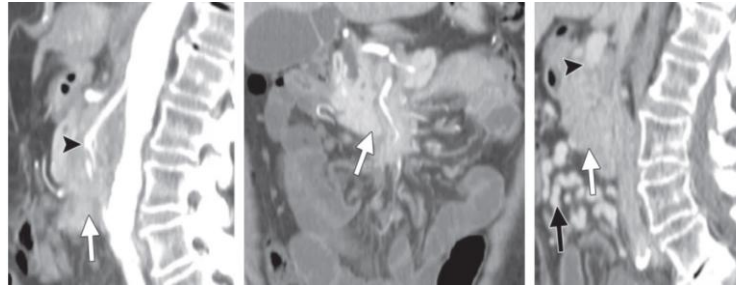
Fig. 1.—Spectrum of linear soft-tissue densities radiating from mesenteric carcinoid tumor. Degree of radiating strands detected by CT scans tends to be directly related to degree of histologic fibrosis.
A–C, CT scans show well-defined, soft-tissue-density mesenteric mass (arrows) with mild (A), moderate (B), and marked (C) degrees of radiating strands. (Reprinted with permission from Buck and Sobin [7].)



Castanho Martins M et al 2026, Blazevic A et al 2021



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Resecabili

Tipo A

**Fibrosi che risparmia l'asse
mesenterico**

Tipo B

**Fibrosi/masse adiacenti SMA
e SMV**

Non Resecabili

Tipo C

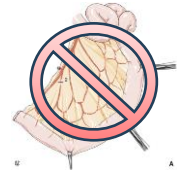
**Fibrosi « a manicotto »
all'origine della SMA o
prossima alla CMA**

Woodbridge et al 2014, Bertani E et al. 2022



Bowel/Vessel sparing Surgery + skip lymphadenectomy

Evitare resezione «a ventaglio» o «pizza pie»



Linfoadenectomia adeguata (> 8)



0-3 metastasi linfonodali – Recurrence Free Survival = **90%**

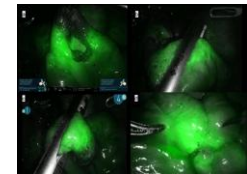
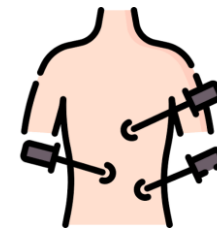
4 + metastasi linfonodali – Recurrence Free Survival = **75%**

Chirurgia mini-invasiva (?)

linfoadenectomia =

Running the bowel vs imaging intraoperatorio

30- 40 % altre localizzazioni





Journal of Gastrointestinal Cancer
<https://doi.org/10.1007/s12029-020-00361-8>

CASE REPORT



Surgical Resection of Multiple Small Bowel Neuroendocrine Tumours Using Intraoperative Fluorescence Angiography with Indocyanine Green Dye

Maria Ana Rafael¹  • Ricardo Rocha² • Ana Maria Oliveira¹ • Catarina Graça Rodrigues¹ • Carla Carneiro² • Vítor Nunes²





7 pazienti

Età mediana 83 anni

IQR 71,5–83,5

Stadio patologico:

prevalenza di malattia N1–N2



Approccio laparoscopico: 6/7

Conversione laparotomica: 4/7

Re-do: 3/7

Complicanze $\geq$ Clavien-Dindo III: 2/7

Degenza mediana: 6 giorni

IQR 5,5–11

Linfonodi asportati: mediana 8

IQR 6,5–11,75

Colorectal NET , numeri

Colorectal Neuro Endocrine Tumors



Istopatologia



Più frequenti nel cieco/ascendente/colon destro

Singole, raramente multiple

Dimensioni maggiori

Frequenti G3

Prognosi sovrapponibile a Si-NEN

WHO Classification 2022-IARC

Incidenze



GEP GastroEnteroPancreatic NEN **3,56 /100000**

Si – NEN **1,05 / 100000**

CR –NET **0,11-0,2 /100000**

Surveillance, Epidemiology, and End Results (SEER)



Razionale endoscopico vs chirurgico

Colonic NET



Endoscopia



NET G1 < 10 mm

Riduzione delle metastasi linfonodali dal 1973 al 2006 dal 71% al 46%

Neoplasie intramucosali < 1 cm = 4% metastasi linfonodali

Follow-up discusso in MDT

Non evidenza di benefici di ESD

Surveillance, Epidemiology, and End Results (SEER)

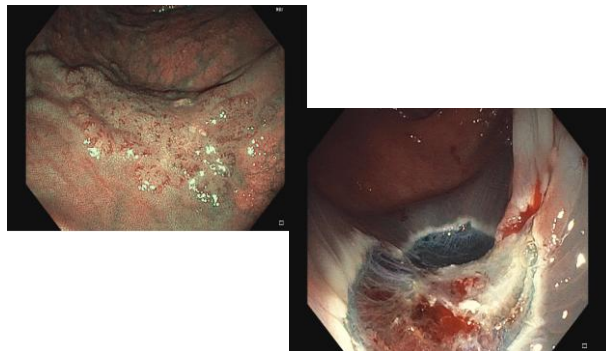
Chirurgia



Resezione endoscopica R1

Tutti gli altri NET

(estensione della resezione simile alla resezione oncologica per CRC)



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Razionale endoscopico vs chirurgico

Rectal NET



RMN (in aggiunta ad EUS)



rNET > 10 mm o invasione LV

rNET G2 G3

Linfonodi ad EUS

Resezione endoscopica R1

Endoscopia



NET G1 < 10 mm

Resezione endoscopica R1



Dimensioni > 2 cm con caratteristiche avverse (G2/G3 L1, V1) → LAR –TME



1-2 cm → resezione endoscopica a tutto spessore

< 1cm → TAMIS per R0 o follow- up dopo work-up negativo

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Follow-up

Chirurgia ad intento curativo dei NET



*Imaging (inclusa MR) e biomarkers ogni 6 mesi in G1,
3-6 mesi in G2 per 5 anni, poi annuale per 15 anni
G3 imaging ogni 6 mesi, PET dotatoc annuale*



- *G1/G2 – N0 TC/MR annuale per 5 anni*
- *G1/G2 N1 TC/MR ogni 6 mesi + PET dotatoc pogni 2 anni*
- *G3 imaging ogni 3 mesi*

Per tutti colonscopia ogni anno



- *G1-< 1 cm-R0 nessun follow-up*
- *G1-G2 L1V1 R0 MRI ogni 6 mesi, PET dotatoc, sigmoidoscopia annuale per 5 anni*
- *G3 MR mensile per 2 anni, poi semestrale , PET ogni anno*



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